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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/994,173	11/26/2001	Jun Sung Yoon	404302000700	9483

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MORRISON & FOERSTER LLP
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EXAMINER

KIM, CHONG R

ART UNIT PAPER NUMBER

2623

DATE MAILED: 09/10/2004

5

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/994,173

Applicant(s)

YOON ET AL.

Examiner

Charles Kim

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 November 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. ____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Drawings

1. Figures 1-5 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-10 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Referring to claim 1, the phrase "determining the positions of the core and the delta within and outside the fingerprint region from the extracted positions of the cores and deltas,

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setting the determined positions as initial parameters of an initial ridge orientation model for the core and delta" in lines 15-21 is not sufficiently supported by the applicant's specification. More specifically, the applicant's specification is non-enabling in regards to how the determined positions of the cores and deltas outside the fingerprint region can be set as the initial parameters of the initial ridge orientation model.

Claims not mentioned specifically are dependent on non-enabled antecedent claims.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "the parameters for core and delta of the ridge orientation function" in lines 30-31. There is insufficient antecedent basis for this limitation in the claim.

Claims not mentioned specifically are dependent on indefinite antecedent claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 4, 5, 9, 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of the article entitled "A Nonlinear Orientation Model for Global Description of Fingerprints" by Vizcaya et al. ("Vizcaya") and Bolle et al., U.S. Patent No. 6,005,963 ("Bolle").

Referring to claim 1, Vizcaya discloses a method for extracting fingerprint feature data using a ridge orientation model, comprising the steps of:

- a) scanning a fingerprint of a person requiring fingerprint recognition with a fingerprint acquisition device, and converting the fingerprint into a digital fingerprint image of predetermined format (pages 1226-1228, section 4);
- b) dividing the fingerprint image into a plurality of regions, each with a predetermined size, and calculating ridge orientations in the regions (page 1228, left column);
- c) evaluating and extracting positions of a core and a delta in the fingerprint region and determining the positions of the core and the delta within and outside the fingerprint region from the extracted positions of the cores and deltas (page 1228, left column);
- d) setting the determined positions as initial parameters of an initial ridge orientation model for the core and delta (page 1228, left column);
- e) calculating a ridge orientation function by calculating parameters with a minimum error between ridge orientation values of the ridge orientation model and ridge orientation values of the fingerprint regions (page 1225, section 3.1); and
- g) calculating ridge orientation values in all regions using the ridge orientation function, and deciding and extracting the positions of the core and the delta from the parameters for core and delta of the ridge orientation function (page 1226-1229, section 4).

Vizcaya does not explicitly disclose the step of calculating qualities of ridges according to regions and separating the fingerprint image into a fingerprint region and a background region according to the calculated ridge qualities. However, this feature was exceedingly well known in the art. For example, Bolle discloses the step of calculating qualities of ridges according to regions and separating a fingerprint image into a fingerprint region and a background region according to the calculated ridge qualities (col. 6, line 13-col. 7, line 5).

Vizcaya and Bolle are combinable because they are both concerned with fingerprint imaging methods. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the method of Vizcaya to include the steps of Bolle. The suggestion/motivation for doing so would have been to provide an accurate and reliable fingerprint imaging process that quantifies fingerprint image quality (Bolle, col. 3, lines 19-29). Therefore, it would have been obvious to combine Vizcaya with Bolle to obtain the invention as specified in claim 1.

Referring to claim 4, Bolle further discloses that if the ridge quality corresponding to the background region is calculated in a fingerprint region, the region having the quality corresponding to the background region and surrounded by the fingerprint regions is processed as a fingerprint region but not a background region (col. 7, lines 6-29).

Referring to claim 5, Vizcaya further discloses that the positions of the core and the delta are extracted by calculating a Poincare Index with respect to each point within a predetermined scope of the fingerprint region (page 1228, left column).

Referring to claim 9, Vizcaya further discloses that the initial ridge orientation model is set by the following Equation:

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$$Om(Z) = Oo + \frac{1}{2} \sum_{k=1}^K g_k(\arg(z - zk); C_{k,1}, C_{k,2}, \dots, C_{k,l})$$

$$\text{where } g_k(\theta) = C_{kl} + \frac{\theta - \theta_1}{2\pi/L} [C_{k,l+1} - C_{k,l}], \theta_1 \leq \theta \leq \theta_{l+1}$$

$$\theta = \arg(z - zk); \theta_{k+1} - \theta_k = \frac{2\pi}{L}; C_{k,l} = g_k(\theta_1)$$

$$C_{k,l} = -\frac{\pi}{2} - \theta_1$$

z_k is the position of a delta

$$C_{k,l} = -\frac{\pi}{2} + \theta_1$$

z_k is the position of a core,

and Oo is "0", z is a complex value ($x+yi$) representing a single arbitrary position in a two-dimensional region, z_k is a complex value representing the position of the core or the delta, K is the total number of cores or deltas, and L is a positive integer (pages 1225-1226, sections 3.1-3.2).

Referring to claim 10, Vizcaya further discloses that the ridge orientation function is determined by optimizing an error of the following equation in a fingerprint region using the steepest descent method,

$$\langle O^2_e \rangle = \int_R (O(z) - O_m(Z))^2 dz$$

where R is the fingerprint region (page 1225, section 3.1).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Hsu et al. U.S. Patent No. 5,995,642 discloses a fingerprint imaging method that segments a fingerprint image into fingerprint regions and background regions based on image quality, and determines the position of the core.

b. "A Model For Interpreting Fingerprint Topology" by Sherlock et al. discloses an orientation model for fingerprint image analysis.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Kim whose telephone number is 703-306-4038. The examiner can normally be reached on Mon thru Thurs 8:30am to 6pm and alternating Fri 9:30am to 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on 703-308-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.


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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



ck

September 1, 2004



Jon Chang
Primary Examiner